REMARKS

Claims 1-20 are pending in this application.

Claim Rejections - 35 U.S.C. § 103(a)

Claims 1-20 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Fiato et al. (U.S. Pat. No. 4,618,597) in view of Ozin et al. (U.S. Pat. No. 4,552,855). To establish a *prima facie* case of obviousness, three basic criteria must be met: first, the prior art reference (or references when combined) must teach or suggest all the claim limitations; second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; finally, there must be a reasonable expectation of success. *See* M.P.E.P. § 2143. If a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *See* M.P.E.P. § 2143.01 V. *See also, In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984) (stating that "The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification.").

The pending claims are directed to self-supported catalyst particles which, despite heating, and against all expectations, have not undergone a phase change from α-Fe_2O_3 to another form (e.g. a spinel form, as in Fiato), such that the catalyst has improved properties when used in a Fischer-Tropsch reaction. Independent Claim 1 recites "[s]elf-supported precipitated α-Fe_2O_3-based Fischer-Tropsch catalyst particles for a Fischer-Tropsch slurry-bed process, which particles are produced according to a method comprising the step of: heat treating precipitated α-Fe_2O_3-based particles at a temperature of from 320°C to 500°C, whereby self-supported precipitated α-Fe_2O_3-based catalyst particles are obtained." Independent Claim 17 recites "[s]elf-supported precipitated α-Fe_2O_3-based Fischer-Tropsch catalyst particles, wherein the particles comprise an average primary particle size of from 2 nm to 4 nm."

Fiato et al. teaches the use of iron manganese spinels (corresponding to chemical formula $(Fe_{1-x}Mn_x)_3O_4$) as catalysts in Fischer-Tropsch synthesis. Manganese in the spinel affects both the chemical and physical properties of the catalyst, which in turn affect both the activity and selectivity of the catalyst, thus resulting in a completely different catalyst from that recited in the pending claims. As acknowledged in the Office Action, Fiato et al. does not disclose an unsupported catalyst comprising iron in the form of α-Fe_2O_3.

Ozin et al. is cited as disclosing alpha iron oxide, it being asserted that it would have been obvious to one of ordinary skill in the art to use the alpha iron oxide of Ozin et al. in the heat treated, unsupported, Fischer-Tropsch catalysts of Fiato because Ozin et al. discloses the alpha iron oxide for use in Fischer-Tropsch catalyst particles, wherein the use results in largely uniform particle size. Applicants respectfully disagree.

Ozin et al. teaches zeolite supported metal catalysts, wherein the metal catalyst is in zero-valent (i.e., non-oxidized) form and is deposited in the α-cavities of the zeolite. The passage at col. 7, line 26-32 is cited in the Office Action as teaching the use of alpha iron oxide as a catalyst in a Fischer-Tropsch process. However, referring to the sentence preceding the cited one, it is clear that the catalyst referred to is in zero-valent (non-oxidized) form: "No further activation treatment of the material is necessary before it is employed as a catalyst, apart from possible removal of residual solvent, it metal component already being present as ***a catalytically active substantially zero-valent form***" (emphasis added), col. 7, lines 21-26. Use of iron oxide catalysts for Fischer-Tropsch processes is not taught, much less alpha iron oxide catalysts in self-supported form.

Referring next to Example 1 of Ozin et al., the sub-caption of Table 1 refers to "γ-IRON OXIDE" – a spinel form – and not alpha iron oxide. The passage at col. 9, lines 15-36 refers to "α-iron oxide"; however, in view of the sub-caption of Table 1 indicating the iron oxide is in the form of γ-iron oxide, it is possible that Ozin et al. was referring to the γ-iron oxide, a spinel form, in the α-cavities of the zeolite as "α-iron oxide", and did not intend to refer to iron oxide in the alpha form.

Even if Ozin et al. disclosed the alpha form of iron oxide, the teachings of Fiato et al. and Ozin et al. are simply incompatible and cannot be modified or combined to yield the self-supported catalyst particles as presently claimed. Ozin et al. as a whole is directed to zero-valent metal catalysts (not oxidized metal catalysts) that are supported by a zeolite (not self-supported catalysts). Even if iron oxide in the alpha form is disclosed in Ozin et al., it is not a desired form and there is no teaching that the oxidized form is suitable for use as a Fischer-Tropsch catalyst, only the zero-valent (non-oxidized form). At best, the iron oxide is a byproduct of the method of manufacture of the recited supported catalysts. The teachings of Ozin et al. are all directed to the zero-valent metal form as a catalyst. Moreover, the support of Ozin et al. is the reason why metal clusters of small particle sizes are obtained – the size of the zeolite pores where the metal is deposited controls the particle size. There is no way to separate the metal clusters from the zeolite support to yield a self-supported catalyst having a particle diameter as taught in Ozin et al. (i.e., a mean particle diameter for the γ-iron oxide of 12.4 Å, at most). Applicants also note that the particle sizes of the catalyst particles deposited in the α-cavities of the zeolite of Ozin et al. are at most 15.1 Å, and that Fiato teaches particle sizes of from 100 to 200 Å - neither reference teaches or suggests a particle size of "2 nm to 4 nm" (corresponding to 20 Å to 40 Å), as recited in pending Claim 17.

Accordingly, Applicants respectfully request withdrawal of the rejection.

Conclusion

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is in condition for allowance. Should the Examiner have any remaining concerns that might prevent the prompt allowance of the application, the Examiner is respectfully invited to contact the undersigned at the telephone number below.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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Dated: 12/12/06

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AMEND

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